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| 10/729,028 | 12/04/2003 | Norbert A. Schmitz | 0140116 | 9999 |

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| EXAMINER | |
|---|---|
| MILORD, MARCEAU | |
| **ART UNIT** | **PAPER NUMBER** |
| 2618 | |

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/729,028 | SCHMITZ ET AL. | |
| | Examiner | Art Unit | |
| | Marceau Milord | 2618 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-15,17-21 and 23-26* is/are rejected.

7)☒ Claim(s) *2,16 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-15, 17-21, 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matero et al (US Patent No 6115585) in view of Vaisanen et al (US Patent No 6560443 B1).

Regarding claim 1, Matero et al discloses an antenna switching circuit capable of coupling a plurality of ports to an antenna (figs. 6-7), said antenna switching circuit (14 and 16 of fig. 6) comprising: a first switch (ANT SWITCH 1 of fig. 6) activated by a first control signal for establishing a connection between a first transmit port and said antenna (col. 2, line 58- col. 3, line 41); a second switch (ANT SWITCH 2 of fig. 6) activated by a second control signal for establishing a connection between a second transmit port and said antenna (col. 5,lines 43-56; col. 6, line40-53; col. 7, lines 13-29); a third switch activated by a third control signal for establishing a connection between a first receive port and said antenna; a fourth switch activated

by said third control signal for establishing a connection between a second receive port and said antenna, wherein said first receive port and said second receive port are simultaneously connected to said antenna when said third switch and said fourth switch are activated by said third control signal.

However, Matero et al does not specifically disclose the steps of a third switch activated by a third control signal for establishing a connection between a first receive port and said antenna; a fourth switch activated by said third control signal for establishing a connection between a second receive port and said antenna, wherein said first receive port and said second receive port are simultaneously connected to said antenna when said third switch and said fourth switch are activated by said third control signal.

Vaisanen et al, on the other hand, discloses an antenna switching circuitry in a multi-transceiver mobile terminal, which features a first switching unit which controllably couples a first transceiver port to either a first antenna port or a second antenna port; and a second switching unit which controllably couples the second antenna port to either the first transceiver port through the first switching unit, or to an input/output port of a second transceiver. According to this scheme, the second antenna port is coupled to the input/output port of the second transceiver in a mode in which the second transceiver is operational, the first transceiver port being decoupled from the second antenna port at this time, wherein the first transceiver port is coupled to the first antenna port and the input/output port of the second transceiver is decoupled from the second antenna port, when the first transceiver is in a transmit mode, and wherein the first transceiver port is coupled to either of the first and second antenna ports, when the first transceiver is in a receiving mode and the input/output port of the second transceiver is

decoupled from the second antenna port (col 4,lines 44-62; col. 6, lines 55-66). Furthermore, the third switching unit SwC is switched to a position where the second antenna port P.sub.A2 is coupled to switch SwB. Also, first switching unit SwA is switched to a position where it connects the first antenna port P.sub.A1 to switch SwB. Through turning of the second switching unit SwB antenna, diversity selection can be made between the first and second antennae ports (fig. 2 and fig. 4; col. 7, line 47- col. 8, line 19). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Vaisanen to the communication system of Matero in order to provide an antennae switching scheme for sharing diversity antennae efficiently and as economically as possible.

Regarding claim 3, Matero et al as modified discloses an antenna switching circuit capable of coupling a plurality of ports to an antenna (figs. 6-7), said antenna switching circuit (14 and 16 of fig. 6) further comprising a bias resistor connected across said first transmit port and said second transmit port, said bias resistor supplying a pull-up bias to an inactive one of said first switch and said second switch (col. 3, lines 22-67; col. 5, lines 43- col. 6, lines 10).

Regarding claim 4, Matero et al as modified discloses an antenna switching circuit capable of coupling a plurality of ports to an antenna (figs. 6-7), said antenna switching circuit (14 and 16 of fig. 6) wherein said first receive port receives low band signals and wherein said second receive port receives high band signals (col. 5,lines 26-61; col. 6, lines 39-63).

Regarding claim 5, Matero et al as modified discloses an antenna switching circuit capable of coupling a plurality of ports to an antenna (figs. 6-7), said antenna switching circuit (14 and 16 of fig. 6) wherein said low band signals are configured in accordance with one of an 850 megahertz GSM band and a 900 megahertz GSM band, and wherein said high band signals

are configured in accordance with one of an 1800 megahertz GSM band and a 1900 megahertz GSM band (col. 6, lines 45-65; col. 7, lines 1-55).

Regarding claim 6, Matero et al as modified discloses an antenna switching circuit capable of coupling a plurality of ports to an antenna (figs. 6-7), said antenna switching circuit (14 and 16 of fig. 6) wherein said first transmit port transmits high band signals, and wherein said second transmit port transmits low band signals (col. 5, lines 26-61; col. 6, lines 39-63).

Regarding claim 7, Matero et al as modified discloses an antenna switching circuit capable of coupling a plurality of ports to an antenna (figs. 6-7), said antenna switching circuit (14 and 16 of fig. 6) wherein said low band signals are configured in accordance with one of an 850 megahertz GSM band and a 900 megahertz GSM band, and wherein said high band signals are configured in accordance with one of an 1800 megahertz GSM band and a 1900 megahertz GSM band (col. 6, lines 45-65; col. 7, lines 1-55).

Regarding claims 8-10, Matero et al discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), said antenna switching circuit comprising means for connecting a first transmit port to said antenna upon receipt of a first control signal; means for connecting a second transmit port to said antenna upon receipt of a second control signal (col. 5,lines 43-56; col. 6, line40-53; col. 7, lines 13-29).

However, Matero et al does not specifically disclose the features of a means for simultaneously connecting a first receive port and a second receive port to said antenna upon receipt of a third control signal; and means for simultaneously connecting a third receive port and a fourth receive port to said antenna upon receipt of a fourth control signal.
Vaisanen et al, on the other hand, discloses an antenna switching circuitry in a multi-transceiver

mobile terminal, which features a first switching unit which controllably couples a first transceiver port to either a first antenna port or a second antenna port; and a second switching unit which controllably couples the second antenna port to either the first transceiver port through the first switching unit, or to an input/output port of a second transceiver. According to this scheme, the second antenna port is coupled to the input/output port of the second transceiver in a mode in which the second transceiver is operational, the first transceiver port being decoupled from the second antenna port at this time, wherein the first transceiver port is coupled to the first antenna port and the input/output port of the second transceiver is decoupled from the second antenna port, when the first transceiver is in a transmit mode, and wherein the first transceiver port is coupled to either of the first and second antenna ports, when the first transceiver is in a receiving mode and the input/output port of the second transceiver is decoupled from the second antenna port (col 4,lines 44-62; col. 6, lines 55-66). Furthermore, the third switching unit SwC is switched to a position where the second antenna port P.sub.A2 is coupled to switch SwB. Also, first switching unit SwA is switched to a position where it connects the first antenna port P.sub.A1 to switch SwB. Through turning of the second switching unit SwB antenna, diversity selection can be made between the first and second antennae ports (fig. 2 and fig. 4; col. 7, line 47- col. 8, line 19). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Vaisanen to the communication system of Matero in order to provide an antennae switching scheme for sharing diversity antennae efficiently and as economically as possible.

Regarding claim 11, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41),

wherein said first receive port receives low band signals and wherein said second receive port receives high band signals.

Regarding claim 12, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), wherein said low band signals are configured in accordance with one of an 850 megahertz GSM band and a 900 megahertz GSM band, and wherein said high band signals are configured in accordance with one of an 1800 megahertz GSM band and a 1900 megahertz GSM band (col. 6, lines 45-65; col. 7, lines 1-55).

Regarding claim 13, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), wherein said first transmit port transmits high band signals, and wherein said second transmit port transmits low band signals (col. 5, lines 26-61; col. 6, lines 39-63).

Regarding claim 14, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), wherein said low band signals are configured in accordance with one of an 850 megahertz GSM band and a 900 megahertz GSM band, and wherein said high band signals are configured in accordance with one of an 1800 megahertz GSM band and a 1900 megahertz GSM band (col. 6, lines 45-65; col. 7, lines 1-55).

Regarding claims 15, Matero et al discloses a transmit module for a mobile phone device, said transmit module coupled to an antenna (figs. 6-7), said transmit module comprising an antenna switching circuit, said antenna switching circuit comprising: a first switch (ANT SWITCH 1 of fig. 6) activated by a first control signal for establishing a connection between a

first transmit port and said antenna (col. 2, line 58- col. 3, line 41); a second switch (ANT SWITCH 2 of fig. 6) activated by a second control signal for establishing a connection between a second transmit port and said antenna (col. 5, lines 43-56; col. 6, line40-53; col. 7, lines 13-29).

However, Matero et al does not specifically disclose the features of a third switch activated by a third control signal for establishing a connection between a first receive port and said antenna; a fourth switch activated by said third control signal for establishing a connection between a second receive port and said antenna, wherein said first receive port and said second receive port are simultaneously connected to said antenna when said third switch and said fourth switch are activated by said third control signal.

Vaisanen et al, on the other hand, discloses an antenna switching circuitry in a multi-transceiver mobile terminal, which features a first switching unit which controllably couples a first transceiver port to either a first antenna port or a second antenna port; and a second switching unit which controllably couples the second antenna port to either the first transceiver port through the first switching unit, or to an input/output port of a second transceiver. According to this scheme, the second antenna port is coupled to the input/output port of the second transceiver in a mode in which the second transceiver is operational, the first transceiver port being decoupled from the second antenna port at this time, wherein the first transceiver port is coupled to the first antenna port and the input/output port of the second transceiver is decoupled from the second antenna port, when the first transceiver is in a transmit mode, and wherein the first transceiver port is coupled to either of the first and second antenna ports, when the first transceiver is in a receiving mode and the input/output port of the second transceiver is decoupled from the second antenna port (col 4,lines 44-62; col. 6, lines 55-66). Furthermore, the

third switching unit SwC is switched to a position where the second antenna port P.sub.A2 is coupled to switch SwB. Also, first switching unit SwA is switched to a position where it connects the first antenna port P.sub.A1 to switch SwB. Through turning of the second switching unit SwB antenna, diversity selection can be made between the first and second antennae ports (fig. 2 and fig. 4; col. 7, line 47- col. 8, line 19). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Vaisanen to the communication system of Matero in order to provide an antennae switching scheme for sharing diversity antennae efficiently and as economically as possible.

Regarding claim 17, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), further comprising a bias resistor connected across said first transmit port and said second transmit port, said bias resistor supplying a pull-up bias to an inactive one of said first switch and said second switch (col. 3, lines 22-67; col. 5, lines 43- col. 6, lines 10).

Regarding claim 18, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), wherein said first receive port receives low band signals and wherein said second receive port receives high band signals (col. 5, lines 26-61; col. 6, lines 39-63).

Regarding claim 19, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), wherein said low band signals are configured in accordance with one of an 850 megahertz GSM band and a 900 megahertz GSM band, and wherein said high band signals are configured in

accordance with one of an 1800 megahertz GSM band and a 1900 megahertz GSM band (col. 6, lines 45-65; col. 7, lines 1-55).

Regarding claim 20, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna (col. 2, line 58- col. 3, line 41), wherein said first transmit port transmits high band signals, and wherein said second transmit port transmits low band signals (col. 5, lines 26-61; col. 6, lines 39-63).

Regarding claim 21, Matero et al discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna, said antenna switching circuit comprising: a first switch (ANT SWITCH 1 of fig. 6) activated by a first control signal for establishing a connection between a first transmit port and said antenna (col. 2, line 58- col. 3, line 41); a second switch (ANT SWITCH 2 of fig. 6) activated by a second control signal for establishing a connection between a second transmit port and said antenna (col. 5,lines 43-56; col. 6, line40-53; col. 7, lines 13-29); a third switch activated by a third control signal for establishing a connection between a first receive port and said antenna; a fourth switch activated by said third control signal for establishing a connection between a second receive port and said antenna, wherein said first receive port and said second receive port are simultaneously connected to said antenna when said third switch and said fourth switch are activated by said third control signal a first control port coupled to a gate of said first switch, said first control port being configured to receive said first control signal; a second control port coupled to a gate of said second switch, said second control port being configured to receive said second control signal.

However, Matero et al does not specifically disclose the steps of a third switch activated by a third control signal for establishing a connection between a first receive port and said

antenna; a fourth switch activated by said third control signal for establishing a connection between a second receive port and said antenna, wherein said first receive port and said second receive port are simultaneously connected to said antenna when said third switch and said fourth switch are activated by said third control signal.

Vaisanen et al, on the other hand, discloses an antenna switching circuitry in a multi-transceiver mobile terminal, which features a first switching unit which controllably couples a first transceiver port to either a first antenna port or a second antenna port; and a second switching unit which controllably couples the second antenna port to either the first transceiver port through the first switching unit, or to an input/output port of a second transceiver. According to this scheme, the second antenna port is coupled to the input/output port of the second transceiver in a mode in which the second transceiver is operational, the first transceiver port being decoupled from the second antenna port at this time, wherein the first transceiver port is coupled to the first antenna port and the input/output port of the second transceiver is decoupled from the second antenna port, when the first transceiver is in a transmit mode, and wherein the first transceiver port is coupled to either of the first and second antenna ports, when the first transceiver is in a receiving mode and the input/output port of the second transceiver is decoupled from the second antenna port (col 4,lines 44-62; col. 6, lines 55-66). Furthermore, the third switching unit SwC is switched to a position where the second antenna port P.sub.A2 is coupled to switch SwB. Also, first switching unit SwA is switched to a position where it connects the first antenna port P.sub.A1 to switch SwB. Through turning of the second switching unit SwB antenna, diversity selection can be made between the first and second antennae ports (fig. 2 and fig. 4; col. 7, line 47- col. 8, line 19). Therefore, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to apply the technique of Vaisanen to the communication system of Matero in order to provide an antennae switching scheme for sharing diversity antennae efficiently and as economically as possible.

Regarding claims23, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna, further comprising a diode having an anode and a cathode, said anode of said diode being coupled to said first control port and said cathode of said diode being coupled to said antenna, said diode preventing excessive consumption in said antenna switching circuit when said antenna switching circuit is operating in a receive mode (col. 3, lines 1-41; col. 8,lines 3-41).

Regarding claim 24, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna, further comprising a diode having an anode and a cathode, said anode of said diode being coupled to said second control port and said cathode of said diode being coupled to said antenna, said diode preventing excessive consumption in said antenna switching circuit when said antenna switching circuit is operating in a receive mode (col. 3, lines 1-41; col. 8,lines 3-41).

Regarding claim 25, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna, wherein said first receive port receives low band signals and wherein said second receive port receives high band signals (col. 5, lines 26-61; col. 6, lines 39-63).

Regarding claim 26, Matero et al as modified discloses an antenna switching circuit (figs. 6-7) capable of coupling a plurality of ports to an antenna, wherein said first transmit port

transmits high band signals, and wherein said second transmit port transmits low band signals (col. 5, lines 26-61; col. 6, lines 39-63).

***Allowable Subject Matter***

3. Claims 2, 16, 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marceau Milord whose telephone number is 571-272-7853. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Art Unit 2618